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ENTOMOLOGICAL NEWS

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Vol. LI No. 10

CONTENTS

Mills—A New Nicoletia (Thysanura, Lepismatidae) from Florida . . 271

Blatchley Memorial Meeting 272

Rau—The Life History of the American Cockroach, Periplaneta americana Linn. (Orthop.: Blattidae). 273

International Commission on Zoological Nomenclature. 278

Henry and Heit—Flight Records of Phyllophaga (Coleoptera: Scarabaeidae) 279

Chamberlin—Four New Polydesmoid Millipeds from North Carolina (Myriapoda) 282

Linsley—Notes and Descriptions of West American Cerambycidae - IV (Coleoptera) 285

Knull—New Cicadellidae (Homoptera). 290

Pettit—The Effect of Isolation on Growth in the Cockroach Blattella germanica (L.) (Orthoptera Blattidae). 293

Current Entomological Literature 294

Review of Needham's Introducing Insects 299

Review of Emaus' About Spiders; Introducing Arachne 299

Review of Thomas' The Biology and Control of Wireworms 300

Obituary—Dr Adolfo Lutz, Dr. Gustavus August Eisen 300

Title-page to Volume LI. Index to Volume LI 301

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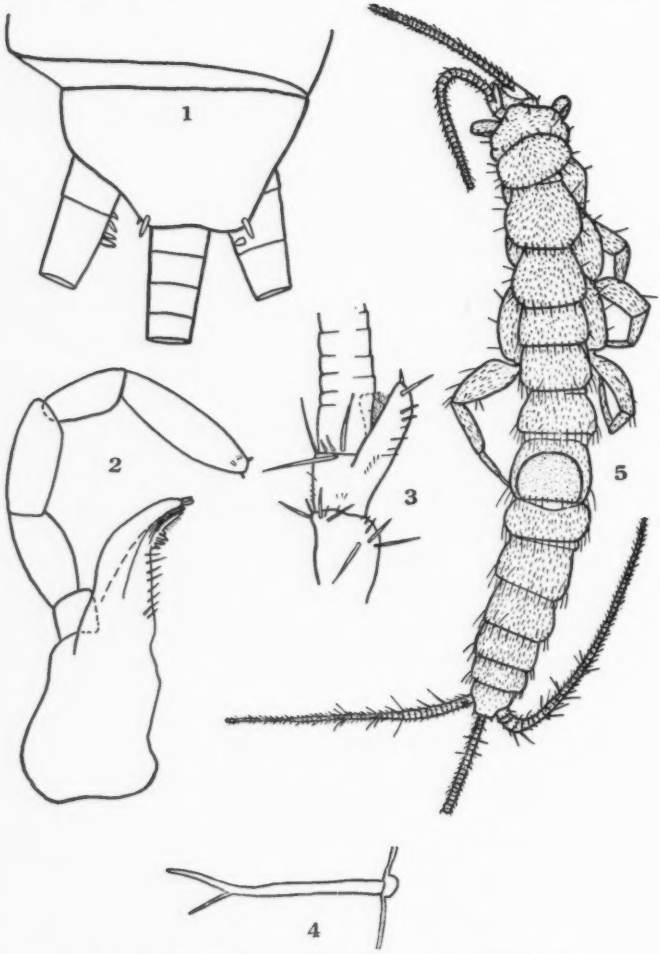


NICOLETIA TERGATA N. SP. (THYSANURA).—MILLS

ENTOMOLOGICAL NEWS

VOL. LI DECEMBER, 1940 No. 10

A New Nicoletia (Thysanura, Lepismatidae) from Florida.

By HARLOW B. MILLS, Montana State College, Bozeman, Montana.

(Plate VII.)

Through the kindness of Dr. T. H. Hubbell of the University of Florida, I have been allowed to study specimens of a peculiar subterranean bristle-tail of the genus *Nicoletia*. This species has proven to be new and the description follows.

Nicoletia tergata n. sp. (Plate VII, figures 1-5).

Body color pale yellow, becoming deeper posteriorly. Appendages nearly white. Body campodeiform, very long and slender (figure 5). Thorax about half the length of the abdomen. Clothing of rather fine reclinate setae, and a row of longer stiff bristles on the margins of the pronotum and the posterior margin of all tergites from the mesothorax to the 9th abdominal segment inclusive. Antennae long and slender, first segment subcylindrical, second segment (male) with a peculiar inner appendage consisting of an elongate finger bearing a number of bristles, and a dorsal pubescent lobe. (figure 3). Maxillary palp 5-segmented, the apical segment bearing 6 slender sensory papillae. Galea flap-shaped, with two large apical sensory papillae. Lacinia with an acute apical tooth and an inner process bearing a fine comb-like structure distally, 4 or 5 heavy teeth medially, and a series of heavy spines basally (figure 2). Labial palp clavate, the last segment large, oval with six compound sensory papillae apically.

Pronotum elliptical, the posterior margin less arcuate than the anterior. Meso—and metanotum bell-shaped. Fourth abdominal tergite remarkably raised and bearing a large semicircle which is flat, more heavily sclerotized, scarcely pubescent, covered with minute punctures in small group, and honey yellow in color. Tenth tergite rather large, trapezoidal, and slightly concave on the posterior and postero-lateral margins. The posterior-lateral margins of the 10th tergite each bear two small, heavy pegs, the larger above and the smaller beneath (figure 1). Styli present on sternites 2 to 9 inclusive, each rather

hairy and terminating in a strong pinnate bristle. Ventral sacs on segments 2 to 8 (?). Male parameres fingerlike, with numerous short setae. Cerci with the usual segmental bristles, long slender sensory hairs, and several whorls of larger bristles. The base of each cercus bears about 4 inner pegs similar to those on the angles of the 10th tergite (figure 1). Pseudocerus with whorls of shorter bristles, sensory hairs, and ventrally long branched vertical bristles (figure 4). Integument reticulate. Body length 7.5 mm., pseudocercus and cerci 4 mm.

This species, known only from males, is distinct in several respects. It is remarkable in the excessive development of the 4th abdominal tergite, which may, howver, be a secondary sexual characteristic. The shape of the basal appendix of the antenna, body setae, armature of the 10th abdominal tergite, and long slender shape separate it from *N. subterranea* Silv., to which it is related in some respects.

Habitat. Newman's Lake, Alachua County, FLORIDA, December 18, 1939, 1 male; December 21, 1939, 2 males, B. A. Barrington. From the burrows of the gopher *Geomys floridanus.* Cotypes in the collection of the University of Florida, and in that of the author.

EXPLANATION OF PLATE VII.

Figure 1, Tenth abdominal tergite, X 48.

Figure 2, Left Maxilla, X 226.

Figure 3, Ventral view right antennae, X 226.

Figure 4, Ventral bifid bristle from pseudocercus, X 226.

Figure 5, Dorsal view of a cotype, X 12.

Blatchley Memorial Meeting.

The W. S. Blatchley Club, formerly the Hamilton County Nature Study Club, held a memorial meeting on October 11, for the late Dr. Blatchley, formerly State Geologist of Indiana [and well-known entomologist], for whom the club was named. The meeting was held at Noblesville and the memorial tribute was given by Dr. J. J. Davis, of Purdue University.—*Science*, Nov. 8, 1940.

The Life History of the American Cockroach, Periplaneta americana Linn. (Orthop.: Blattidae).

By PHIL RAU, Kirkwood, Missouri.

(Continued from page 227.)

The second species of parasitic wasp to affect the egg-cases of *P. americana* was *Tetrastichus hageowi* Ratz. [A. B. Gahan det.] On October 18, 1938, 25 individuals emerged from one egg-case of this cockroach. The egg-case had been deposited on August 1, 1938 and was properly covered by the mother roach with rust. It is of course not known when the egg-case was parasitized, but since the parasites could not have affected the egg-case before it was deposited, the duration of life from egg to adult must have been less than 78 days. It is not known if there are other records of this Hymenopteron parasitizing cockroach egg-cases, but a record of various species belonging to the genus *Tetrastichus* in "Insects of New York" (Cornell Agric. Exp. Stat. Memoir 101, p. 984, 1926) shows that it is parasitic on insects other than Orthoptera. Two species, *T. juniperi* and *T. marcovitchi* are recorded as having been reared from juniper berries; *T. agrile* from *Agrilus sinuatus; T. rapae* from *Apanteles glomeratus;* and *T. malacosomae* from the eggs of the apple-tree tent-caterpillar. In the "Hymenoptera of Connecticut" (pp. 453-454, 1916) I also find records of members of the genus parasitizing a still wider range of insects, some of which indicate hyperparasitism: *T. modestus* were reared from cocoons of *Apanteles edwardii* on *Vanessa atlanta; T. semidiae* from *Oencis norma; T. productus* from the Hessian fly; *T. saundersi* and *T. thecla* from a butterfly of the genus Thecla; *T. caeruleseens* is parasitic on *Habrobracon gelechiae,* a primary parasite on *Conarsia hammondi* while two other unknown species have been reared from various other species of insects.

ENEMIES.

Early in the work on *P. americana,* I was under the impression that roaches required a damp environment and for a while I gave them not only a damp environment but often a very wet one. Later observations showed that this species

thrives equally well in a dry environment if it have a shallow tin of water, or a supply of succulent vegetables such as lettuce or cabbage. Moisture caused heavy fungus growths on the food supply, and was responsible for the appearance of enormous populations of the mites, *Rhizoglyphus tarsalus* Banks [H. E. Ewing det.]. These became so numerous at times that the glass vessels became opaque with their numbers. They undoubtedly were responsible, when they became too numerous at times, for the curtailment of life of the roaches. They would attack the dead and dying and sometimes living cockroaches. When the numbers in the jars were small they remained pretty close to the items of starchy food and left the cockroaches alone. A few mites on a roach would seem not to affect it. Some jars, strange to say, would be entirely unaffected by them, and often when infected cockroaches were placed in clean jars their length of life was comparable with those that had no infestation. "To the genus *Rhizoglyphus,*" says Banks, (U. S. Dept. Agric. Report 108, p. 116, 1915) "belong a number of species found on the ground, in decaying matter, on roots of plants and in bulbs."

Another insect that seemed to breed well in the jars containing American cockroaches was the dipterous insect, *Rhegmoclema atrata* Say [Alan Stone det.]. The flies fed and bred in the stale food and filth, and in so far as I could see they did not at all affect the life of the cockroaches.

Roaches as Food for Other Animals.

No doubt the American roach serves as food for many other animals, but the records are very meager. The American as well as the Oriental roach was the principal item of diet for several years of a pet tarantule belonging to a friend. In Frank Cowan's "Curious Facts in the History of Insects" (1865, chapter 3), are listed many curious items of the medicinal uses of cockroaches, the use of cockroaches as food for hedgehog, monkey and lemur, and the superstitious practices to rid houses of roaches.

The Duration of Life of Adults.

There is a general opinion abroad that roaches of the house hold are extremely long-lived, and statements to that effect

often creep into entomological literature. As an example, I may cite David Sharp (Insects, Part 1, p. 229, 1895) who says that the common black beetle, *Blatta orientalis*, requires several years to attain the adult stage and it is probable that the life of an individual may extend to five years. In *B. orientalis* (Trans. Acad. Sci. St. Louis 25: 59-60, 1924) the length of life from the hatching of the egg to the death of the adult is about one year, and the same length of time was observed in the woodroach *Parcoblatta pennsylvanica* (Ent. News 51: 4-9, 33-35, 1940). For the American roach I have gathered data on the length of life of 17 males and 35 females, as tabulated below.

Males Days	Duration of Life Frequency	Females Days	Duration of Life Frequency
25 to 30	3	30 to 35	4
50 to 55	2	40 to 45	4
56 to 60	2	46 to 50	1
70 to 75	6	80 to 85	9
85 to 90	2	90 to 95	2
105 to 110	2	100 to 105	4
		106 to 110	3
		115 to 120	3
		135 to 140	2
		150 to 155	2
		173	1
	Total 17		Total 35

The figures are for the duration of life after the cockroaches arrived from New Orleans on June 3, 1937. They came as adults and I do not know how long they had lived as adults before they arrived. The figures are, therefore, not for the total period of adult life, but only for that portion of which they lived in confinement. The data given above, show that 17 males lived from 25 to 110 days and 35 females lived from 30 to 173 days. The length of life was so varied that an average would not be a true picture of conditions. However, the figures do indicate a long life for some of the adults, 5 to 6 months for a few females and 2½ to 3 months for males. the males had a shorter duration of life than the females;

however, the same is not true for other material given in later pages.

In a lot of 5 American adult roaches trapped at St. Louis on April 22, 1938, the females lived 61, 91 and 101 days in confinement and the males lived 124 and 234 days respectively. These figures in terms of months give the maximum for females of 3 to 3½ months; for the males 4 to 7-2/3 months.

The following data are more accurate and significant, since the figures show the actual length of life of the adult from the time of its last moult to its death. The roach nymphs in the last instar came from New Orleans and as they changed into adults they were isolated and a record kept of each individual:

Females Days	Duration of Life Frequency	Males Days	Duration of Life Frequency
60 to 70	2	30 to 40	4
140 to 150	2	50 to 60	3
160 to 170	3	70 to 80	9
		80 to 90	1
		130	1
		170 to 180	3
	Total 7		Total 21

Here we see that the maximum length of adult life for both sexes is nearly the same, approximately 170 days or about six months.

In material reared from the hatching of the egg to the death of the adult, I have notes on the duration of adult life (from the last moult to the death of the adult) on 5 insects, 3 females and 2 of unrecorded sex. This lot differs from the material in the table above, in that the insects had spent their entire nymphal life in confinement.

Became Adult	Died	Length of Life
Sept. 30, 1938	June 30, 1939	8-2/3 months
Aug. 8, 1938	June 18, 1939	10-1/3 months
Sept. 7, 1938	Sept. 8, 1939	12 months
Oct. 10, 1938	Sept. 6, 1939	11 months
Oct. 8, 1938	Sept. 4, 1939	11 months

These five records probably give us a truer picture of adult length of life than the data in the foregoing pages. Here we

find that as adults they lived from 8-2/3 months to one year,* a length of life far greater than that recorded for adults either of *B. orientalis* which averaged for the males 40.2 days and for the females 43.5 days (loc. cit., p. 62) and for females of *Parcoblatta pennsylvanica* which varied from 35 to 160 days (Rau, *loc. cit.*, p. 33).

Length of Life from the Time of Hatching to the Death of the Adult.

Records were kept on the entire length of life—from birth to death. The experiment started with a great many cockroaches but the infant mortality was great and only 11 insects reached adulthood.

Sex	Date of Hatching	Date Became Adult	Date Died	Length of Life from Hatching to Last Moult; Months	Length of Life from Last Moult to Death; Months	Total Length of Life; Months
F	Aug. 17/37	Nov. 2/38	Jan. 10/39	14-1/2	2-1/2	17
F	Aug. 15/37	Oct. 15/38	Mar. 2/39	14	4-1/2	18-1/2
F	Aug. 17/37	Oct. 12/38	Feb. 20/39	14	4-1/4	18-1/2
F	Aug. 14/37	Sept. 19/38	Aug. 30/39	13-1/6	11-1/4	24-1/2
M	Aug. 17/37	July 28/38	Jan. 12/39	11-1/2	5-1/2	17
M	Aug. 14/37	Oct. 10/38	Sept. 3/39	13-3/4	10-3/4	24-1/2
M	Aug. 14/37	Aug. 31/38	Aug. 20/39	12-1/2	12	24-1/2
M	Aug. 14/37	Sept. 17/38	Sept. 12/39	13-1/6	12	25-1/6
?	Aug. 14/37	Sept. 19/38	Feb. 10/39	13-1/3	4-2/3	18
?	Aug. 17/37	Oct. 1/38	Jan. 30/39	13-1/2	4	17-1/2
?	Aug. 15/37	Sept. 1/38	Jan. 27/39	12-1/2	4	16-1/2

Here, the record shows that the larval length of life of 11 roaches varied from 11 to 14 months, and length of adult life varied from 2½ months to a year; four of the latter group living from 10 to 12 months while seven of them lived from 2½ to 5½ months; but the combined length of life of nymph and adult (from hatching to death) is from 16½ to 24½ months. This is quite a long siege of living for a roach in confinement,

* It is interesting to note in this connection that an egg-case obtained from a female when nearly one year old proved good and gave forth 14 young.

and whether the same condition holds for roaches in their natural haunts, I do not know; however, these figures are in line with Nigran's (Indian Journ. Agric. Science 3: 530-543, 1933) who finds that *americana* requires from 13 to 15 months to become adult but under conditions of moisture, darkness and rich food the period is about 10 months and Marlatt, (U. S. Dept. Agric. Cir. 51, 1908) has recorded the total nymphal period as 11 months.

Of all roaches with which I am acquainted, *P. americana* with a total length of life reaching a maximum of about two years, comes nearest Sharp's statement of a five year duration of life for cockroaches.

ERRATUM. Page 186, third line of text should read: and usually requires more than 24 hours for completion.

International Commission on Zoological Nomenclature.

The International Commission on Zoological Nomenclature has commenced the publication of the Opinions rendered by the Commission, Volume 2. Opinions 134-136, with the following titles, have been published, and are available to purchasers. Copies may be obtained from the Commission, c/o The Royal Entomological Society of London, 41, Queen's Gate, South Kensington, London, S. W. 7. Further opinions are in the press and will be published shortly.

OPINION 134. On the method to be adopted in interpreting the Generic Names assigned by Freyer to species described in his *Neuere Beiträge zur Schmetterlingskunde,* 1833-58. Price 8d.

OPINION 135. The suppression of the so-called "Erlangen List" of 1801. Price 8d.

OPINION 136. Opinion supplementary to Opinion 11 on the interpretation of Latreille's *Considérations générales sur l'ordre naturel des animaux composant les classes des Crustacés, des Arachnides et des Insectes avec un tableau methodique de leurs genres disposés en familles,* Paris, 1810. Price 1s. 0d.

Flight Records of Phyllophaga (Coleoptera: Scarabaeidae).

By H. K. Henry, Biology Department, Haverford College, and C. E. Heit,* New York State Conservation Department.

Due to a heavy infestation of white grubs, larvae of *Phyllophaga* and other phytophagous Scarabaeidae, in the seed beds and transplant areas of the Saratoga Forest Tree Nursery, Saratoga Springs, New York, the Conservation Department of the State authorized a study to be made of the biology of the species present with the hope that improved methods of control might be obtained. From a count of adults taken in light traps flight records were obtained more complete than any others seen by the authors and are given here for the use of those working in the same field.

The original equipment for the study consisted of 16 light traps of the electrocutor type. The traps were hung from wooden uprights with the light source, a 75 watt inside frosted bulb, about 7 feet from the ground. The traps were set out in two rows 75 feet apart each way and covered approximately 2 acres of seed beds. After the first year funnel type traps were substituted for the electrocutor type and either 100 or 150 watt daylight bulbs for the 75 watt. At the beginning of the 1937 season each alternate trap was removed, reducing the number of traps to 8 but giving approximately the same coverage to the seed beds.

During the five years covered by this record 14 species of *Phyllophaga* were taken in the traps of these one species, *P. longispina*, has not been recorded previously from the state and three others, *P. gracilis*, *P. forsteri* and *P. hirsuta* were listed only from stations in the vicinity of New York City. The species and number of each taken are given in Table 1.

The traps were operated intermittently during the first warm weather of spring and continuously after the first catch. They then remained in continuous nightly operation until no beetles were taken. The traps were examined each morning and the

* Mr. Heit is at present connected with the N. Y. State Agric. Experiment Station at Geneva, N. Y.

Table 1.

YEARLY RECORD OF PHYLLOPHAGA.

Species	1934	1935	1936	1937	1938
P. gracilis	8719	1279	3141	[2] 54	[2]1790
P. tristis	[1]532	266	6790	187	888
P. crenulata	[1]509	857	552	[2]797	[2]297
P. fusca	[1]237	1470	29	161	272
P. fraterna	[1]364	274	49	[2]1050	[2]102
P. anxia	[1] 14	463	59	105	49
P. longispina	10	30	13	10	38
P. marginalis	2	5	9	2	2
P. hirticula	7	0	0	10	0
P. drakei	0	5	9	1	0
P. hirsuta	6	0	0	0	0
P. fosteri	1	0	0	0	0
P. balia	1	0	0	0	0
P. ilicis	0	0	0	1	0
	10402	4649	10651	2378	3438

sex and species of each beetle determined. Difficult specimens were identified by Dr. R. D. Glasgow, New York State Entomologist. The flight period at Saratoga Springs of the 14 species as determined by light trapping is given in Table 2.

Table 2.

FIRST AND LAST DATES OF CAPTURE AND LONGEST FLIGHT.

Species	First	Last	Longest Flight Period No. of Days	Year
P. crenulata	May 6	Aug. 21	101	'36
P. fusca	April 27	July 19	78	'38
P. fraterna	May 8	Aug. 9	84	'34
P. anxia	April 27	July 9	74	'35
P. tristis	May 6	July 7	63	'38
P. gracilis	July 7	Sept. 4	62	'34
P. longispina	May 11	July 10	45	'35
P. marginalis	June 6	July 21	40	'35
P. hirticula	June 4	July 21	39	'37
P. drakei	April 10	June 18	39	'36
P. hirsuta	June 16	June 18	3	'34
P. balia	June 2	June 2	1	'34
P. fosteri	July 5	July 5	1	'34
P. ilicis	July 3	July 3	1	'37

[1] Trapping not begun until after probable beginning of flight period.
[2] Trapping discontinued before probable end of flight period.

The extreme length of the flight periods indicated in Table 2 is in a way misleading, as throughout part of the period only stragglers were taken. The bulk of each species was captured in a relatively short time. Table 3 shows the period during which ninety per cent of the individuals of the six most numerous species was taken.

Table 3.

PERIOD DURING WHICH NINETY PER CENT OF THE FLIGHT OCCURRED.

Species	Period	Length in Days
P. crenulata	5/10-7/10	51
P. fraterna	5/22-6/30	40
P. anxia	5/4 -6/9	37
P. fusca	5/20-6/14	25
P. tristis	5/8 -5/28	21
P. gracilis	7/11-7/31	21

With a view to possible control of grubs through capture of females the sex of each specimen was determined and a record kept for each species. Table 4 gives the data for the six most numerous species.

Table 4.

TOTAL CATCH.

			Per Cent	
Species	Males	Females	Males	Females
P. fraterna	1666	173	90	10
P. gracilis	13285	1698	88	12
P. tristis	5881	2782	78	22
P. crenulata	2364	648	77	23
P. fusca	1023	1146	47	53
P. anxia	327	363	47	53

An apparent difference in reaction to light is shown between the species of *Phyllophaga*, but here again the table may be somewhat misleading. The species in which a slightly greater number of females than males were taken were the species whose grubs occurred in greatest numbers near the traps. The greater number of males taken for the other species may well be an indication of the tendency of the males to aimless and greater flight than the females, rather than a greater phototropic response in the males. It is certainly true that although some grubs of all the species were found in the lighted area,

the number of grubs of the first four species of table 4 were never present in the abundance which the catch of the adults would have suggested.

In a light trapping experiment over a period of five years at Saratoga Springs, New York, 14 species of *Phyllophaga* were taken. Their flight periods varied from 101 days to 39 days with a total flight of over four months. In two of the species, *P. anxia* and *P. fusca* females were taken in slightly greater numbers than the males.

Four New Polydesmoid Millipeds from North Carolina (Myriapoda).

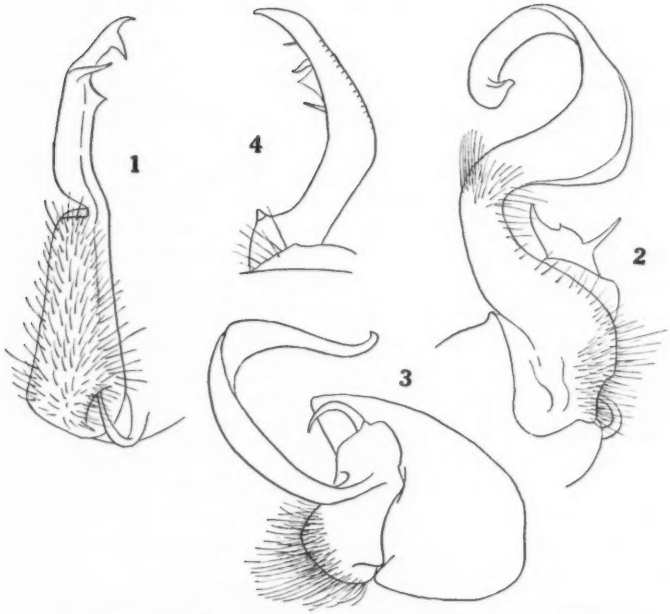
By RALPH V. CHAMBERLIN, University of Utah, Salt Lake City.

Of the four species described in the present paper, the first three are based upon material collected by Prof. A. S. Pearse in the Pisgah National Forest, North Carolina, in 1933. The *Brachydesmus* is based upon specimens collected by Dr. Wm. S. Cornwell in 1934 and by Mrs. Nelle B. Causey in 1939 on the Duke University grounds. The holotypes are retained by the author. Paratypes of *Mimuloria furcifer* and of *Apheloria waccamana* are deposited at the Philadelphia Academy of Sciences.

Mimloria furcifer new species (Fig. 1).

A clearly larger species than *ducilla,* distinguishable at once in having the spots of the middorsal line shorter, subcircular, instead of extended along caudal border and ordinarily reaching light areas of the keels; dorsum in types dark chocolate to nearly black except for the median spots and the subquadrate spots on the keels which are yellow. In the preserved specimens the legs are yellow, the antennae chocolate brown.

This species in the form of the gonopods of the male is very similar to *ducilla,* but is at once to be separated by the presence of a distinct angulation on the upper edge of the telopodite whereas in *ducilla* that edge is smoothly curved. See further figure 1.



EXPLANATION OF FIGURES. 1. *Mimuloria furcifer*, sp. n. Right gonopod of male, mesoventral view. 2. *Sigmoria brachygon*, sp. n. Right gonopod of male, subventral view. 3. *Apheloria waccamana*, sp. n. Left gonopod, subventral view. 4. *Brachydesmus dux*, sp. n. Left gonopod, ectal view.

Width of male 8.2 mm., as against 6.25 mm. in *ducilla*.

Locality—NORTH CAROLINA: Pisgah National Forest, Asheville. Four specimens taken by Prof. A. S. Pearse, June 3, 1933.

Sigmoria brachygon new species (Fig. 2).

A robust form with wide keels continuing the slope of the dorsum.

Dorsum in the preserved types a dull grayish brown, with the keels in part more yellowish, but the color not sharply defined or set off. Legs yellow. Types probably not in full color.

No sternal or coxal processes. Charcterized by the form of the broad, laminate gonopods as illustrated.

Length, 43 mm.; width, 11 mm.

Locality—North Carolina: Pisgah National Forest, Glen Bald. Male and female taken by Prof. A. S. Pearse, June 3, 1933.

Apheloria waccamana new species (Fig. 3).

Dorsum from dark chocolate to black; keels yellow over entire length, the dorsal black extending outward in an angle just back of anterior corner; a median dorsal series of yellow spots, one spot in front of caudal margin of each tergite; collum with entire keels yellow, but dark color extending outward along each border, and with two spots on median line, one larger one at anterior border and a smaller one at caudal; cauda yellow; antennae dark; legs yellow.

Gonopods of male as drawn in fig. 3.

Length of male *holotype,* 36 mm.; width, 9.8 mm.

Locality.—North Carolina: Lake Waccamana. Types taken by Prof. A. S. Pearse, April 16, 1933, in "Pisgah National Forest" and in the Duke University Forest.

Brachydesmus dux new species (Fig. 4).

General color of dorsum and antennae a somewhat horn brown, the keels not lighter. Legs a paler brown.

Head clothed with short erect setae, these not dense. Sulcus across vertex of head distinct. .. ..

Collum distinctly wider than head proper, but narrower than head with mandibles and narrower than second tergite. A row of small setigerous nodules or tubercles followed by a series of intermediate size along caudal border.

Ordinary tergites with keels on about level with mid-dorsal region, two transverse rows of large distinct tubercles and a row of small ones along caudal border; keels with three lateral teeth.

The species is best indentified from the structure of the gonopods of the male of which a drawing is given, fig. 4.

Length, 10 mm.

Locality.—North Carolina: Duke University campus.

Notes and Descriptions of West American Cerambycidae - IV (Coleoptera).

By E. Gorton Linsley, University of California, Berkeley.

(Continued from page 258.)

Methia robusta new species.

♂ : Form short, robust; color dark brownish, elytra with pale vittae; pubescence short, pale, subrecumbent, with an intermixture of longer, erect, pale hairs in certain areas.

Head wider than elytra at base; eyes rather broadly rounded beneath and extending below mouthparts, more widely separated below than above, separated on vertex by about half the width of the third antennal segment, on underside of head by about the greatest diameter of the antennal scape, dorsal and ventral lobes approximate, connected posteriorly by a double row of facets; vertex, behind the eyes, finely rugulose; neck coarsely, distinctly punctured, the punctures varying from less than one to one puncture width apart; antennae more than twice as long as body, scape stout, about three times as long as its greatest width, apical tooth feeble, second segment short, more than twice as broad as long, third segment a little more robust than, not as long as, fourth segment.

Pronotum a little broader than long, sides rounded, widest behind the middle, base slightly constricted, as wide as apex; anterior margin feebly, finely, irregularly carinulate; disk finely rugulose, without evident punctures; surface sparsely clothed with long, erect and suberect, pale hairs; stridulatory plate of mesonotum feebly, evenly convex, sides narrowed in front of scutellar base, surface without a median, longitudinal ridge.

Elytra about three times as long as pronotum, two and one-fourth times as long as broad, sides straight, slightly attenuated apically; costae scarcely evident, surface finely scabrous, clothed with short, pale, subrecumbent hairs, longer, but not erect, on basal margin; apices rather broadly, separately rounded.

Legs clothed with moderately long, pale hairs, posterior tibiae feebly sinuate before apex; posterior tarsi with first segment a little longer than the two following together.

Abdomen shining, sternites coarsely punctured, clothed with long, pale, prostrate and suberect hairs. Length: 6.5mm.

Holotype: male (No. 5013, Calif. Acad. Sci. Ent.), from Claremont, California, June 28, 1931, collected and presented to the writer by Mr. H. L. McKenzie.

This species is perhaps the most robust of the known forms. It is related to *M. brevis* Fall, but differs in having the eyes more narrowly separated on the vertex, more widely separated and more broadly rounded beneath, the pronotum broader than long, and the elytra with pale vittae. The antennal scape is more robust than in any of the specimens of *brevis* which I have seen, and the color is brownish rather than black.

Methia dubia new species.

♂ : Short, moderately robust; color dark brownish; pubescence short, pale, recumbent, intermixed with longer erect hairs. Head nearly as wide as base of elytra; eyes broadly rounded beneath, more widely separated below than above, separated on vertex by nearly the greatest diameter of the antennal scape, on the underside of head by at least the greatest width of scape, dorsal and ventral lobes connected by a single row of facets; vertex coarsely, distinctly punctured behind the eyes; antennae one-and-two-thirds times as long as body, scape moderately stout, apex with a short blunt tooth, second segment nearly as long as broad, third segment distinctly stouter than, and barely longer than, fourth segment.

Pronotum slightly broader than long, widest behind the middle, sides rounded, base not constricted, as wide as apex; surface clothed with short, pale, recumbent pubescence sparsely intermixed with longer, erect hairs; stridulatory plate of mesonotum more or less evenly, feebly convex, without a median longitudinal ridge.

Elytra three times as long as pronotum, a little more than twice as long as broad, sides straight; surface clothed with short, pale, recumbent pubescence with a few erect hairs at base; costae distinct; apices broadly, separately rounded.

Legs slender, clothed with pale, suberect hairs; posterior tibiae straight; posterior tarsus with first segment as long as two following together.

Abdomen with sternites feebly shining, finely sparsely clothed with short, pale hairs. Length: 5 mm.

Holotype: male (Knull collection) taken at Wickenberg, Arizona, June 16, D. J. and J. N. Knull, collectors.

This species is apparently related to *M. brevis* Fall, but differs in the more widely separated eyes, connected posteriorly by a single row of facets, distinctly costate elytra, and the shorter, sparser, erect hairs of the pronotum.

Methia acostata new species.

♂ : Robust, short; color black, opaque, elytra with a large, pale testaceous fascia before apex; pubescence short, pale, recumbent, intermixed with longer, erect hairs.

Head nearly as wide as elytra at base; eyes broadly rounded beneath, more widely separated below than above, separated on vertex by nearly the greatest width of antennal scape, on underside by at least the greatest width of scape, dorsal and ventral lobes connected posteriorly by a single row of facets; vertex behind the eyes rough, coarsely, shallowly, indistinctly punctured; antennae about twice as long as body, scape moderately stout, apex with a feeble tooth, second segment nearly as long as broad, third segment thicker than, and barely longer than, fourth segment.

Pronotum wider than long, sides rounded, widest behind the middle, base not constricted, about as wide as apex; surface clothed with moderately long, erect, pale hairs in addition to the shorter recumbent pubescence; disk opaque, obscurely punctured; anterior margin feebly shining, closely, transversely carinulate; stridulatory plate of mesonotum very feebly, evenly convex, without a median, longitudinal ridge, sides straight, parallel, suddenly widened at base of scutellum.

Elytra three times as long as pronotum about twice as long as broad, attenuated apically; surface rough, scabrous, clothed with short, pale, recumbent hairs, slightly longer than basal margin but not erect; costae not evident; apices rather narrowly, separately rounded.

Legs slender, clothed with long, erect, pale hairs; posterior tibiae straight; posterior tarsi with first segment equal to the two following together. Abdomen feebly shining, sternites sparsely clothed with fine, pale hairs. Length: 4.75 mm.

Holotype male (Knull collection), from Hualpai, ARIZONA, July 3, collected by D. J. and J. N. Knull.

This species is related to *M. brevis* Fall and *M. dubia* Linsley, from both of which it differs in having the eyes more widely separated on the vertex (by nearly the greatest diameter of antennal scape) elytra with a large pale fascia before apex, and the narrowly rounded elytral apices. From *M. dubia* it further differs in the absence of elytral costae. From *M. subarmata* it may be distinguished by the punctation of the neck, the feeble apical tooth of the antennal scape, the less prominent elytral

humeri, the shorter, sparser antennal cilia, and the long, erect hairs of the pronotum.

Methia knulli new species.

♀ : Elongate, slender; color pale testaceous, head and abdomen darker, eyes black, pubescence modtrately long, suberect, brownish, intermixed with pale hairs. Head nearly as wide as base of elytra; eyes broadly rounded below, more widely separated below than above, separated on vertex by less than the greatest width of the antennal scape, on underside of head by at least the greatest width of the scape, dorsal and ventral lobes connected posteriorly by a single row of facets, more or less broken at middle; vertex coarsely, distinctly punctured behind the eyes; antennae one and one-third times as long as the body, densely hairy, scape slender, apical tooth feeble, second segment distinct, twice as wide as long, third segment scarcely more robust than, about one-fourth longer than, fourth segment.

Pronotum slightly broader than long, sides rounded, base shallowly but distinctly constricted, about as wide as apex; surface clothed with moderately long, erect and suberect, brownish hairs; stridulatory plate of mesonotum more or less evenly, feebly convex, without a narrow, elevated longitudinal, median ridge.

Elytra about four times as long as pronotum, a little less than three times as long as broad, sides straight, not expanding laterally toward apex; surface clothed with moderately long, suberect, brownish and pale hairs; costae distinct; apices broadly, separately rounded.

Legs slender, clothed with long, erect, brownish hairs; tibiae straight; posterior tarsi with first segment equal in length to the two following together.

Abdomen feebly shining, first four sternites shallowly punctured, tessellate, sparsely pubescent, brownish, fifth sternite pale testaceous, more densely clothed with suberect, brownish hairs. Length: 8.5 mm.

Holotype: female (Knull collection), from Hualpai, Arizona, July 3, collected by D. J. and J. N. Knull.

This species is closely related to *aestiva* Fall, with which it agrees in general form and the type and arrangement of pubescence. It differs, however, in having the eyes more widely separated on the vertex, in the shorter elytra, which in the female are less than three times as long as broad, in the feeble

apical tooth of the antennal scape, and the dark brownish pubescence.

Methia carinata new species.

♀ : Elongate, slender; color testaceous, head and abdomen darker; eyes black; pubescence short, recumbent, pale, without an intermixture of long, pale, erect hairs. Head nearly as wide as base of elytra; eyes broadly rounded beneath, more widely separated below than above, separated on vertex by the greatest width of antennal scape, on underside by nearly one-and-one-half times the greatest width of the scape, dorsal and ventral lobes connected posteriorly by a double row of facets; neck rough and indistinctly punctured behind eyes; antennae one-and-one-third times as long as body, sparsely hairy, scape slender, apical tooth not evident, second segment distinct, wider than long, third segment scarcely more robust than, and about one-fifth longer than, fourth segment.

Pronotum slightly broader than long, sides rounded, base not constricted, as wide as apex; surface clothed with short, recumbent, pale hairs, without an intermixture of longer, erect hairs; stridulatory plate of mesonotum with a strongly elevated, narrow, median, longitudinal ridge.

Elytra less than four times as long as the pronotum and about two and one-half times as long as broad, sides bent outward toward apex; surface clothed with very short, recumbent, pale hairs, without an intermixture of longer, erect hairs; costae distinct at base, evanescent apically; apices broadly, separately rounded.

Legs clothed with short, recumbent, pale hairs; posterior tibiae straight; posterior tarsus with first segment a little longer than the two following together.

Abdomen shining; first four sternites piceous, fifth sternite testaceous, clothed with fine, short, silky, pale pubescence. Length: 8 mm.

♂ : Short, slender; color dark brownish, antennae and elytra paler; eyes narrowly rounded beneath, equally separated above and below by about the diameter of the third antennal segment; antennae one and one-third times as long as the body; elytra nearly three times as long as pronotum, twice as long as broad; posterior tibiae slightly sinuate. Length: 6 mm.

Holotype female and *allotype* male (both in Knull collection), from Hualpai, ARIZONA, July 2 and July 6 respectively, collected by D. J. and J. N. Knull.

This species is related to *M. falli* Martin, with which it agrees in the ridged mesonotal stridulatory plate and type of pubescence, but the latter differs by its uniform brown color, the shallowly punctured neck, shorter third segment of the antennae, feebly basally constricted pronotum, and by having the eyes more widely separated below than above. It superficially resembles *M. aestiva* Fall and *M. knulli* Linsley, but may be immediately separated by the uniform, short recumbent pubescence and the structure of the stridulatory plate. In the type of pubescence, *carinata* agrees with *pusilla* Newman, but differs from the latter in having the eyes more widely separated on the vertex (in *pusilla* they are nearly contiguous) and the dorsal and ventral lobes connected posteriorly by a double row of facets, in the evenly rounded pronotum without a basal constriction, and in the distinct second segment of the antennae (in *pusilla* the second segment is very short, usually concealed within the apex of the scape).

New Cicadellidae (Homoptera).

By Dorothy Johnson Knull, Columbus, Ohio.

Carneocephala balli n. sp.

Smaller than *C. floridana* (Ball) near which it should be placed, due to its long vertex which exceeds the pronotum in median length in both sexes. Smaller too than *C. gillettei* (Ball) which it otherwise resembles. Length: male, 4.3 mm.; female, 5 mm.

♂. Head, including eyes, wider than pronotum. Vertex swollen apically, concave behind middle, and decidedly excavated laterad of ocelli; coarsely granulated; including eyes a little less than twice as broad as long; lateral margins convex, apex bluntly angulate; ocelli large, slightly closer to posterior than to lateral margin. Pronotum coarsely granulate, distinctly shorter than vertex, sides almost parallel, posterior margin faintly emarginate with sides broadly rounded; scutellum small, somewhat granulate. Elytra longer than abdomen, nervures distinct, apical reticulations sparse.

Last ventral segment twice as long as preceding, valve small, triangular, three times as wide as long; plates as long as last ventral segment, tubular, closely appressed, inner margins divergently rounded at apex, exceeded in length by pygofer.

Vertex pale yellow, a dark brown square at apex, irregular blotches below, and a narrow fuscous line extending from middle to base; frontal sutures irregularly mottled with light brown, dark lines extending from ocelli, sparse discal mottling, a dark impressed point on each side on posterior margin midway between median line and lateral margin. Scutellum pale yellow with a small dark point within each basal angle, black median impressed line, and black hair-line along margins. Elytra dark green with minute brown punctures, veins pale green. Face yellow, darker toward middle, frontal arcs distinct, thorax and legs chiefly yellowish green, abdomen bright red, pygofer and last ventral segment tinged with green.

♀. Vertex not definitely concave behind middle, nor as swollen apically as in male. General color pale straw with irregular fuscous mottling on vertex, leaving only basal median line distinct. Below pale straw but for dark tarsal claws. Last ventral segment more than twice as long as preceding, posterior margin with emarginated lobe on median fourth, deeply sinuated to produced lateral angles.

Male *holotype* and female *allotype* taken at Holbrook, ARIZONA, July 28, 1938, by D. J. and J. N. Knull. Types in collection of The Ohio State University.

Named for Dr. E. D. Ball, originator of the genus.

Alebra interrogata n. sp.

This small species with its extensive pale green markings seems quite distinct in character from any previously described member of this genus.

♂. Vertex a little more than half-length of pronotum, scarcely produced at apex, margins about parallel, eyes large, occupying more than two-thirds surface; pronotum posteriorly wider than vertex, hind margin very obtusely angulate; scutellum large, equilaterally triangular with the apex swollen, especially noticeable from side; elytron with appendix extending from base of cell M_4 just beyond M_2; apical cells R_1 and R_3 triangular, about equal in size, M_2 elongate, twice as long as wide, with anterior third bent feebly toward costa, M_4 apically not quite as wide as M_2 but a third longer and almost twice as wide basally. Wing with three closed apical cells and

submarginal vein. But for the extended appendix, the venation approximates that of *Protalebra similis* Baker as illustrated by McAtee.*

Front long, narrow, tapering toward clypeus which is also long, a little broader at middle and narrows to bluntly rounded apex; no distinct suture between front and clypeus. Last ventral segment as long at middle as preceding segment, but a third longer at sides as posterior margin is angulately excavated. No valve visible; plates widest at base, distinctly indented near inner margin before middle, produced more than twice width and gradually narrowing to acute tips; seven coarse white hairs and numerous fine ones toward outer apical margins.

♀ similar in structure, a little more robust, with last ventral segment three times as long as preceding, bluntly produced on posterior margin, with median portion above ovipositor narnarowly embrowned, ovipositor stout, slightly exceeding pygofer.

Eyes brown, median vitta of vertex white with rounded knob at apex, remainder sordid yellow darkened interiorly; pronotum with pale median vitta and humeral angles, remainder sordid yellow with underlying dark coloring producing greenish cast; scutellum sordid yellow with brown transverse median impressed line, narrow yellow longitudinal median vitta between darker basal angles, apex pale, darkened around swollen area; elytron chiefly pale green with basic milky white appearing on clavus in small oval area bordering scutellum and angulate stripe across middle; corium pale at base, middle, and before crossveins; costa pale green to hyaline, dusky bordered plaque; apical veins and sectors approaching apex broadly yellowish white definitely outlined by dark brown blotches, centers of cells hyaline, apices fumose. Veins bordering inner apical cell form a large pale question mark. Appendix smoky semihyaline. Dorsum dark brown, face and venter mostly yellow with dark tarsal claws, bases of spines of hind femora, and a dark brown area below center of male plates extending narrowly along inner margins.

Length, both sexes, 3 mm.

Male *holotype*, female *allotype*, 36 *paratypes*, Starr County, Texas, June 2, 1939, D. J. and J. N. Knull; 2 *paratypes*, Zapata County, Texas, June 2, 1939, D. J. and J. N. Knull.

Holotype, allotype and paratypes in collection of author, paratypes in Collection of The Ohio State University, U. S. National

*W. L. McAtee, Jour. N. Y. Ent. Soc. 34: Fig. 4, p. 173, 1926.

Museum and Academy of Natural Sciences of Philadelphia. Tha host plant is *Cordia biossieri* DC., as determined by Dr. F. W. Pennell of the Philadelphia Academy. I am grateful to Mr. P. W. Oman for his examination of specimens.

The Effect of Isolation on Growth in the Cockroach Blattella germanica (L.) (Orthoptera Blattidae).

Investigators who employ the common household roach, *Blattella germanica* (*L.*), for studies on growth and nutrition, often isolate the nymphs to prevent cannibalism.

When nymphs reared in isolation are compared with others from the same litter which have been reared in groups, it is found that a longer time elapses before the isolated nymphs accomplish equivalent molts. As would be expected, the longer stadia of the isolated nymphs delay the attainment of maturity. Comparisons between animals reared in isolation and those reared in groups must thus be made with caution.

This slower growth of isolated nymphs may be ascribed to the absence of jostling and mutual stimulation. Similarly, Faure* and others have noted differences between migratory locusts reared under crowded conditions and those reared in isolation; but in Faure's experiments the increased activity gave rise to structural and colorational differences. In *Blattella germanica,* differences of this sort have not been detected; the altered metabolism, under conditions of crowding and resulting stimulation, appears merely to affect the time required to reach maturity. Such differences in growth rate are detectable up to 23 to 25° C., but are less noticeable as the temperature increases because the nymphal period and the differences are similarly reduced.

When large-sample experiments now in progress have been subjected to analysis of variance for such factors as sex-ratio (males appear to mature earlier than females) and possible variation among litters, fuller data will be presented.—LINCOLN C. PETTIT, Washington and Lee University, Lexington, Virginia.

* Faure, Jacobus C. The phases of locusts in South Africa. Bull. Ent. Res., 23 pp 293-405, 25 pl., 1 map. 1932.

Current Entomological Literature

COMPILED BY V. S. L. PATE, L. S. MACKEY and E. G. FISHER.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

This list gives references of the current or preceding year unless otherwise noted. All continued papers, with few exceptions, are recorded only at their first installment.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

Note. References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

The figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of Entomological News for 10c. The number of, or annual volume, and in some cases the part, heft, &c., the latter within ( )follows; then the pagination follows the colon :

Papers published in the Entomological News are not listed.

GENERAL.—Blackwelder, R. E.—Some aspects of modern taxonomy. [6] 43: 245-257. **Böttcher, F. K.**—Pflanzenschutz und Bienenzucht. [Forsch. und Fortsch., Berlin] 16: 229-230. **Chagnon, G.**—A preliminary list of the insects collected in the Laurentide Provincial Park. Montmorency County, Quebec. [70th Ann. Rep. Ent. Soc. Ontario] 1939: 83-87. **Cumley, R. W.**—Comparison of serologic and taxonomic relationships of Drosophila species. [6] 43: 265-274, ill. **Davis, W. T.**—Natural History records from the meetings of Staten Island Nature Club. [Proc. Staten Island Inst. Arts & Sci.] 9: 23-51. **Fletcher, F. C.**—See under Coleoptera. **Heikertinger, F.**—Was jeder Zoologe von den nomenklaturfragen wissen soll. [34] 130: 139-155. **Hutchins, R. E.**—Insect activity at a light trap during various periods of the night. [12] 33: 654-657, ill. **Leitinger-Micoletzky, E.**—Die Tiersukzession auf Fichtenschlägen. [89] 73: 467-504, ill. **McKeown, K. C.**—Insect habitat groups. [Aust. Mus. Mag.] 7: 116-119, ill. **Williams, C. B.**—An analysis of four years captures of insects in a light trap. Part II. The effect of weather conditions on insect activity and the estimation and forecasting of changes in the insect population. [36] 90: 227-306, ill.

ANATOMY, PHYSIOLOGY, ETC.—Bowers & McCay.—Insect life without Vitamin A. [68] 92: 291. **Butenandt, Weidel & Becker.**—Kynurenin als Augenpigmentbildung

auslosendes Agens bei Insekten. [Die Naturwissen., Berlin] 28: 63-64, ill. **Cope, O. B.**—The morphology of Psocus confraternus (Psocid.). [Microent.] 5: 91-115, ill. **v. Frankenberg, G.**—Putzapparate. [Mikrokosmos] 33: 145-148, ill. **Frisch, K. V.**—See under Hymenoptera. **Frolova, S. L.**—Peculiarities of maturation of unfertilized eggs of Bombyx mori activated by high temperature. [Comptes Rendus, Acad. Sci. USSR] 27: 601-603, ill. Cytology of development of parthenogenetic eggs of Bombyx mori activated by high temperature. [Comptes Rendus, Acad. Sci. USSR] 27: 604-606. **Köhler, W.**—Erbliche ausfallserscheinungen und regulationen am pupalen flügeltracheensystem von Ephestia kükniella. [97] 60: 348-367, ill. **Mendes, L. O. T.**—See under Hemiptera. **Piepho, H.**—Ueber die hemmung der verpuppung durch Corpora allata. Untersuchungen an der wachsmotte Galleria mellonella. [97] 60: 367-393, ill. **Podesta, T.**—Ueber ein neues organ an der basis des abdomens von Acidalia. [34] 129: 266-268, ill. **Prelinger, Dr.**—Champagnerpfropfen-und Flaschenorgane bei den Ameisen. [Mikrokosmos] 33: 125-127, ill. **Rakshpal, R.**—See under Hemiptera. **Schwan, H.**—Beitrag zur kenntnis der atmung holometaboler insekten wahrend der metamorphose. [83] 32 (A): 15 pp., ill. **Sendler, O.**—Vorgange aus dem bienenleben vom standpunkte der entwicklungsphysiologie. [94] 153: 39-82, ill. **Timoféeff-Ressovsky, N. W.**—Spontane und strahleninduzierte Mutabilität in geographisch verschiedenen Stämmen von Drosophila melanogaster. [97] 60: 267-275. **Tomohiro, M.**—On the chromosomes of the harvester, Gagrellopsis nodulifera. [Jour. Sci. Hirosima Univ.] 7 (B): 157-168, ill. **Uhmann, E.**—See under Coleoptera.

ARACHNIDA AND MYRIOPODA.—Blanchard, E. E.—Tres Ácaros Dañinos para los cultivos Argentinos. [Rev. Fac. Agron. La Plata 24: 11-18, ill. (*). **Chamberlin, R. V.**—A new trap-door spider from Texas. [95] 52: 5-6. A new arachnid of the order Pedipalpida. [95] 52: 123-124, ill. Two new geophiloid chilopods from Mexico and Texas. [95] 53: 65-66. On six new lithobiid centipeds from North Carolina. [95] 53: 75-77. New American Tarantulas of the family Aviculariidae. [Bull. Univ. Utah] Biol. Ser. Vol. 5: 39 pp. (k). On some Diplopods of the family Fontariidae. [Bull. Univ. Utah.] Biol. Ser. Vol. 5: 19 pp., ill. (*). On a diplopod collection from Barro Colorado Island, Panama. [Bull. Univ. Utah] Biol. Ser. Vol. 5:

16 pp. (*). New genera and species of North American Paraiulidae. [Bull. Univ. Utah] Biol. Ser. Vol. 5: 39 pp. ill. (*). **Chamberlin & Gertsch.**—Descriptions of new Gnaphosidae from the United States. [40] No. 1068: 19 pp., ill. **Chamberlin & Ivie.**—New Tarantulas from the southwestern states. [Bull. Univ. Utah] Biol. Ser. Vol. 5: 17 pp., ill. Agelenid spiders of the genus Cicurina. [Bull. Univ. Utah] Biol. Ser. Vol. 5: 108 pp., ill. (k*). **Fichter, E.**—Studies of North American Solpugida. The true identity of Eremobates pallipes. [Amer. Midl. Nat.] 24: 351-360, ill. **Marshall, R.**—On the occurrence of water mites in the food of turtles. [Amer. Midl. Nat.] 24: 361-364, ill. **Riley, W. A.**—The tropical rat mite, Liponyssus bacoti in Minnesota. [Jour. Parasit.] 26: 433. **Schulze, P.**—Eine neue Ornithodoros-Art aus Brasilien. [34] 130: 131-135, ill. **Simon, F.**—See under Neuroptera.

THE SMALLER ORDERS OF INSECTS.—Cope, O. B.—See under Anatomy. **da Costa Lima, A.**—Nota sobre as especies de "Tunga". (Tungid.). [Acta Medica] 5: 4 pp. (k). **Davis, C.**—Taxonomic notes on the order Embioptera. The genus Rhagadochir and genera convergent to it. [Pro. Linn. Soc. N. S. Wales] 65: 171-191, ill. (k s*). **Eichler, W.**—Notulae Mallophagologicae. I. [34] 129: 158-162. (*). Notulae Mallophagologicae. IV. [34] 130: 97-103, ill., cont. **Leigh, W. H.**—Preliminary studies on parasites of Upland game birds and fur-bearing mammals in Illinois. [Div. Nat. Hist. Surv. Ill. Bull.] 21: 185-194, ill. **Roesler, R.**—Neue und wenig bekannte Copeognathengattungen I. [34] 129: 225-243, 130: 1-25, ill. (s). **Simon, F.**—The parasites of the sage grouse, Centrocercus urophasianus. [Univ. Wyom. Publ.] 7: 77-100, ill. **Thompson, G. B.**—Anoplura (Siphunculata & Mallophaga) from Juan Fernandez hosts. [Nat. Hist. Juan Fernandez & Easter Id.] 3: 639-642. (s). **Trembley & Bishopp.**—Distribution and hosts of some fleas of economic importance. [12] 33: 701-703. **Werneck, F. L.**—Oito especies novas de Mallophaga encontradas em mammiferos. [Brasil-Medico] 49: 5 pp. (s).

ORTHOPTERA.—Davis, W. T.—(see under General). **Rosillo, A. M.**—Primeras observaciones biologicas sobre Marellia. [Mem. Mus. de Entre Rios] 1940, No. 15: 20 pp. (s).

HEMIPTERA.—Bruner, S. C.—A new tingitid from

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LEPIDOPTERA.—Chermock, F. H.—New Melanic moths from southwestern Pennsylvania. [Proc. Penna. Acad. Sci.] 14: 138-140. **Chermock & Chermock.**—A new race of Euphydryas phaeton. [Pro. Penn. Acad. Sci.] 14: 140. A new sphinx from eastern United States. [Pro. Penna. Acad. Sci.] 14: 137-138. **Field, W. D.**—A distributional note on Achalarus Lyciades. [103] 13: 114. A distributional note on Heterochroa bredowii (Nymphalid.). [103] 13: 123. A note on Argynnis cybele krautwurmi (Nymphalid.). [103] 13: 129. **Fox, R. M.**—A generic review of the Ithomiinae (Nymphalid.). [1] 66: 161-207, ill. (s*). **V. Frankenberg, G.**—Schmetterlingseier. [Mikrokosmos] 33: 153-156, ill. **Hayward, K. J.**—Enumeracion sistematica de los Lepidopteros de Entre Rios. [Mem. Mus. de Entre Rios] 1940, No. 13: 17 pp. **Maxwell & Lord.**—Notes on Lampronia rubiella, a raspberry pest new to North America. [70th Ann. Rep. Ent. Soc. Ontario] 1939: 49-51. **Moore, S.**—A list of the butterflies of Michigan. [114] No. 411: 23 pp., ill. **Sanford, L. J.**—A new record for Connecticut. [6] 43: 244. Atrytone logan. [6] 43: 258.

DIPTERA.—Bos & Nieschulz.—Einige weitere versuche mit ueberwinternden exemplaren von Culex pipiens. [34] 129: 151-153. **Breland, O. P.**—Some parasites and hyperparasites of the Cecropia moth. [6] 43: 259-264. **Cumley, R. W.**—(see under general). **Enderlein, G.**—Die Dipterenfauna der Juan-Fernandez-Inseln und der Oster-Insel. [Nat. Hist. Juan Fernandez & Easter Id.] 3: 643-680, ill. (s*). **Hallock, H. C.**—The Sarcophaginae and their relatives in New York. [6] 43: 201-230, ill. (*). **Hardy, D. E.**—Dorylaidae notes and descriptions [103] 13: 101-114, ill. (*). **Hull, F. M.**—Some new species of Syrphidae. [91]

30: 432-434. (s). **Morrison, F. O.**—A revision of the American species of Gonia (Tachinid.). [Can. Jour. Res.] 18: 336-362, ill. (k*). **Timoféeff-Ressovsky, N. W.**—See under Anatomy. **Vargas, L.**—Nuevas observaciones sobre Anopheles mexicanos. [Ciencia] 1: 256-258, ill. (k). Clave para identificar algunos generos de mosquitoes americanos, utilizando los caracteres de los adultos. [Rev. Inst Salulbrid. y Enfermedad. Tropicales] 1: 189-198. (k). Clave para identificar las hembras de Anopheles Mexicanos. [Rev. Inst. Salulbrid. y Enfermedad Tropicales] 1: 199-203. (k). **Zavrel, J.**—Clinotanypus und Coelotanypus. [34] 129: 105-110.

COLEOPTERA.—Bruce, N.—Coleoptera-Cryptophagidae von Juan Fernandez. [Nat. Hist. Juan Fernandez & Easter Id.] 3: 681-688, ill. (*). **Bruch, C.**—Dos comunicaciones Coleopterológicas. [Rev. Fac. Agron. La Plata] 24: 19-28, ill. (*). **Fletcher, F. C.**—The collecting and preservation of Coleoptera. [Ward's Nat. Sci. Bull.] 14: 7-9, 8-12, ill. **Hatch, M. H.**—Observations on Silphinae with a note on intraspecific variations and their designation. [6] 43: 233-244. **Hinton, H. E.**—A synopsis of the genus Elmoparnus (Dryopid.). [9] 73: 183-189, ill. **Neu, W.**—Der zeitliche unterschied im schwarmen von Melolontha hippocastani und M. melolontha. [34] 129: 177-184, ill. **Obenberger, J.**—Dos nuevos buprestidos del Peru. [Flora y Fauna Peruanas] 1: 18-19. **Shough, W. W.**—The feeding of ground beetles. [Amer. Midl. Nat.] 24: 336-344. **Swezey, O. H.**—Micromalthus debilis in Hawaii. (Micromalthidae). [37] 10: 459. **Thomas, C. A.**—The biology and control of wire-worms. [Penna. State Coll. Sch. Agric. & Exp. Sta.] Bull. 392: 90 pp. **Uhmann, E.**—Die Klauen der Hispinen. [34] 130: 119-123, ill. **Weiss, H. B.**—The death-feint of Trox unistriatus. [6] 43: 303-304.

HYMENOPTERA.—Andrews, E. A.—Ant mounds in winder woods. [Sci. Month.] 1940: 419-421, ill. **Breland, O. P.**—(see under Diptera.). **da Costa Lima, A.**—Uma nova especie de Hadronotus (Scelionid.). [Chacaras e Quintais] 1940: 4 pp., ill. (s). **Frisch, J. A.**—Did the Peckhams witness the invention of a tool by Ammophila urnaria? [Amer. Midl. Nat.] 24: 345-350. **Frisch, K. V.**—Die Tanze und das Zeitgedachtnis der Bienen im Widerspruch. [Die Naturwissensch.] 28: 65-69, ill. **Goetsch & Stoppel.**—Die pilze der Blattschneider-Ameisen. [97] 60:

393-398, ill. (s). **Obenberger, J.**—Los tapones vivos. [Flora y Fauna Peruanas] 1: 14-16, ill. (s). **Prelinger, Dr.**—See under Anatomy. **de Santis, L.**—Sinopsis del genero "Physcus". [Rev. Fac. Agron. La Plata] 24: 29-44, ill. (*k). **Udine & Pinckney.**—Some egg parasites of Oecanthus quadripunctatus and of a species of Orchelimum. [Pro. Penna. Acad. Sci.] 14: 81-84. **Walley, G. S.**—A revision of the ichneumon-flies of the genus Campoplegidea occurring in America north of Mexico. [Sci. Agric.] 20: 647-734, ill. (*k).

INTRODUCING INSECTS: A Book for Beginners. By JAMES G. NEEDHAM. The Jacques Cattell Press, Lancaster, Pa. 1940. 129 p. $1.50. — No subject in natural history offers greater variety, greater numbers, more remarkable color and form, and more readily available material for observation and for collection than insects. And we have seen no book which tells how to get acquainted with insects more simply than this one. It is written with authority, but in language anyone can understand. Its illustrations are drawings which for this purpose are definitely preferable to photographs. Surprisingly much is told in so short a space of the habits of many kinds of insects and their way of life. Useful information on insect control methods and directions for making an insect collection are welcome features of the book. Insects are called by their common names.—CHARLES E. MOHR.

ABOUT SPIDERS; INTRODUCING ARACHNE. By ELAINE V. EMAUS. E. P. Dutton Co., New York. 1940. 177 pp. $2.50.—"This book is for all who do not know about, and so do not care about, spiders." And it is the work of a charming young author who started out knowing "scarcely anything about spiders". So it is only natural that her viewpoint should be that of the interested amateur naturalist and that she should avoid unessential technicalities. Interestingly illustrated with photographs and 22 line drawings, printed in rather large, easily read type, and written in a delightful, conversational style, this little book should be attractive to children and grown-ups alike. Most readers will find a new appetite for information about spiders whetted by the all too brief accounts in this book and will likely go on to other popular and technical publications so frequently and interestingly reported upon in the text.—CHARLES E. MOHR.

THE BIOLOGY AND CONTROL OF WIREWORMS. A review of the literature By C. T. THOMAS. Bulletin 392 Pennsylvania State College School of Agriculture and Experiment Station. May, 1940. 90 pp.—Prof. Thomas says: "In 1930, the writer summarized in Bulletin 259 of the Pennsylvania Agricultural Experiment Station practically all of the control literature which had been published up to that date . . . that bulletin has been out of print for several years, and since 1930, about 400 more papers on wireworm biology and control have been published. The present bulletin is an attempt to bring together all of the available wireworm literature of the past 10 years, and to present it in such a form that it may be readily usable by growers, extension workers or researchers on this group of insects." The data here brought together are grouped under the headings: Biology, Life History and Ecology; Environment; Biological control of wireworms; Insecticides used against Elaterid larvae; Attachments and repellents; Planting practices; Cultivation practices; Crop rotation and Miscellaneous control methods. A bibliography occupies pp. 78-90. This bulletin will surely fulfill the purpose for which it has been planned.—P. P. CALVERT.

OBITUARY

Science for November 8, 1940, announces the deaths of Dr. ADOLFO LUTZ, of the Oswaldo Cruz Institute of Rio de Janeiro, on October 6, at the age of 84 years, and of Dr. GUSTAVUS AUGUST EISEN, of the California Academy of Sciences, on October 29, at the age of 93 years.

Dr. Lutz was the author of many entomological papers, especially on the medical side.

Dr. Eisen was born in Stockholm, Sweden, August 2, 1847, came to the United States in 1873 and was naturalized in 1887. He explored Mexico and Central America, 1880-1903, during part of which time (1893-1900) he was curator of the California Academy of Sciences. Entomologists will remember him for the collections of insects which he made in Baja California, and in Tepic, Mexico, and for articles on the caprification of the fig. Biographical data concerning him are to be found in *American Men of Science* and (longer) in *Who's Who in America.*

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The date of mailing the December, 1940, number will be announced on the last page of the issue for January, 1941.

INDEX TO VOLUME LI.

(* indicates new genera, species, names, etc.)

ALEXANDER, C. P. Review: The Revista de Entomologia. 19
Undescribed species of craneflies from the eastern United States and Canada. Part VI. 83, 99
BAILEY, S. F. The History of the Riker Mount..... 91
BELKIN, J. N. Notes on North American Bostrichidae.. 192
BEQUAERT, J. New or little-known neotropical Polistes... 79
BLAISDELL, F. E. A new species of Helodes from Marin County, California 190
BODENSTEIN, W. G. Corrections and additions to "The Genotypes of the Chrysididae"..... 50
BORROR, D. J. A list of the dragonflies taken in the region of Muscongus Bay, Maine 45, 74
BROWN, H. E. A new species of Pseudogonatopus..... 10
CADBURY (see Robinson & Cadbury)
CALVERT, P. P. An unpublished letter of Dr. Thaddeus William Harris 65
Notices: 3, 9, 11, 20, 27, 30, 51, 166, 168, 210, 300.
Obituary: Kenneth J. Morton..... 73
Obituary: Edward Payson Van Duzee..... 240
Review: Meadow and Pasture Insects..... 28
Review: Fleas of Eastern United States..... 119
Review: Compendium of Entomological Methods..... 178
Review: The Chemistry and Toxicology of Insecticides 179
Review: Studies in the Mecoptera 179
Review: Living Light 208
Review: An Introduction to Entomology..... 269
Review: The biology and control of wireworms..... 300
CARY, M. M. Spring collecting in the far South and the big freeze of 1940 165
CAZIER, M. A. The species of Polyphylla in America, north of Mexico 134
A new Diplotaxis and a new synonym..... 251

CHAMBERLIN, R. V. Two new Lithobiid chilopods from burrows of the Florida Pocket Gopher..... 48
Four new Polydesmoid Millipeds from North Carolina 282
CHAMBERLIN, R. V. & MULAIK, S. On a collection of centipedes from Texas, New Mexico and Arizona, 107, 125, 156.
COCKERELL, T. D. A. A dragon-fly from the Eocene of Colorado 103
Review: The North American Bees of the genus Osmia 28
COOKE, H. C. Observations on mating flights of the mayfly Stenonema vicarium 12
CRESSON, E. T., JR. Review: Destructive and useful insects; their habits and control..... 177
Review: The Spider Book 178
DAVIS, E. M. Dragonfly collecting in eastern Massachusetts: 1939 61
DRAKE, C. J. An undescribed Corythucha from Colorado 172
EMERSON, K. C. The distribution of Reduviidae in Oklahoma 139
FISHER, E. G. A list of Maryland Odonata.....37, 67
New Mycetophilidae from North Carolina..... 243
(See Pate, Mackey and Fisher)
FOX, H. Schistocerca americana unusually abundant in Southern New Jersey during the autumn of 1939 43
FRASER, F. C. & CALVERT, P. P. Obituary: Kenneth J. Morton 237
HARMSTON, F. C. & KNOWLTON, G. F. New and little-known Utah Dolichopodidae 129
HARRIS, H. M. A new Pagasa from the United States.. 35
HARRIS, T. W. Unpublished letter 65
HEBARD, M. Replacement of two preoccupied generic names of Blattidae 139
A new generic name to replace Sigmoidella Hebard, not of Cushman and Ozana..... 236
HEIT, C. E. (see Henry, H. K. & Heit, C. E.)
HENRY, H. K. & Heit, C. E. Flight records of Phyllophaga 279

HESS, A. D. A simple method for photographing insect wings 15
The altitudinal range of dragonflies in the Pikes Peak Region 31
HUBBELL, T. H. Notice of a forth-coming check-list of North American Orthoptera 90
HULL, F. M. Some neotropical syrphid flies..... 247
KNOWLTON, G. F. A new geranium aphid..... 196
KNOWLTON (see Harmston, F. C. & Knowlton, G. F.)
KNULL, D. J. New Cicadellidae 290
LINSLEY, E. G. Notes and descriptions of West American Cerambycidae 253, 285
LIST, G. M. Rocky Mountain Conference of Entomologists 197
MACKEY, L. S. (see Pate, Mackey and Fisher)
METCALF, Z. P. How many insects are there in the world? 219
MILLS, H. B. A new Nicoletia from Florida 271
MOHR, C. E. Review: About spiders; introducing Arachne 299
Review: Introducing insects 299
MULAIK, (see Chamberlin, R. V. & Mulaik, S.)
PATE, V. S. L., MACKEY, L. S. AND FISHER, E. G., Current Entomological Literature: 21, 52, 86, 111, 142, 173, 201, 228, 259, 294.
PETTIT, L. C. The effect of isolation on growth in the cockroach, Blattella germanica 293
PYLE, R. W. The anatomy and histology of the digestive system of a supposedly non-feeding adult moth, Callosamia promethea 181, 211
RAU, P. The life history of the wood-roach, Parcoblatta pennsylvanica 4, 33
The life history of the American cockroach, Periplaneta americana: 121, 151, 186, 223, 273.
REHN, J. A. G. A substitute name for Bion Rehn, 1937 60
The cockroach Supella supellectilium in California.... 222
REHN, J. A. G. & REHN, J. W. H. The generic name Lethus 216
REHN, J. W. H. Review: Fossil Orthoptera Ensifera... 59

ROBINSON, M. Review: The Fabrician Types of Insects in the Hunterian Collection at Glasgow University. Coleoptera, Part II 235
ROBINSON & CADBURY. Megasoma elephas in Pennsylvania 72
SABROSKY, C. W. Entomological usage of subspecific names 159
SABROSKY, (see Steyskal & Sabrosky)
SANDERSON, M. W. Two new species of Batrisodes from South Carolina 169
SLABAUGH, R. E. A new Thysanuran, and a key to the domestic species of Lepismatidae found in the United States 95
SLIFER, E. H. Variations in the spermatheca of two species of grasshoppers 1
STEYSKAL, G. C. & SABROSKY, C. W. Diptera of Michigan 242
STONER, D. Apateticus ludovicianus, A synonym of Andrallus spinidens 60
TIMBERLAKE, P. H. A new species of Encopognathus from California (Sphecoid.) 167
WALKER, E. M. A new Gomphus from Louisiana..... 194
WESSON, L. G. A gynandromorph of Aphaenogaster fulva subsp. aquia 241
WILLIAMS, R. C., JR. Review: The Butterflies of the Niagara Frontier Region and Beginners' Guide for Collecting, Rearing and Preserving them..... 269
WING, M. W. Some cheap editions of books on Entomology 16
The occurrence of Gryllus domesticus in Maine..... 227
Review: A Laboratory Guide in Entomology, for Introductory Courses 150
WORTH, C. B. Protective shape and coloration of the spider, Cyclosa bifurca 17
YOUNG, F. N. Description of a new water beetle from Florida 198

GENERAL SUBJECTS

Biological Photographic Association, Meeting of the.. 200
Blatchley Memorial Meeting. 272
Books on Entomology, Cheap Editions of 16
Charles Robertson Collection of Insects 85
Collecting in the far South.. 165
Current Entomological Literature: 21, 52, 86, 111, 142, 173, 201, 228, 259, 294.
Diseases, Insect-borne 258
Dartmouth College, Entomology at 106
Fernald Club Yearbook for 1939 166
India, Entomological Society of 20
Insect-borne diseases, Research on 258
International Commission on Zoological Nomenclature, Opinions 134 to 136... 278
Juan Mina Entomological Station 51
Journal, New entomological.. 30
Parasites, Insect 227
Photographing insect wings.. 15
Plant Hosts, 43, 165, 167, 293.
Protective shape and coloration of the Spider..... 17
Riker Mount, History of the. 91
Rocky Mountain Conference of Entomologists 197
Serial, New entomological.... 27
Subspecific names, Entomological usage of 159
World?, How many insects are there in the..... 219
Yellow Fever Service in Brazil 185

OBITUARY NOTICES

Blatchley, W. S. 210
Britton, W. E., Tribute to... 9
Chapman, R. N. 3
Eisen, G. A. 300
Fall, H. C. 51
Horn, Walther 11
Knower, H. M. 51
Lutz, A. 300
Morton, K. J. 73, 237
Van Duzee, E. P. 240
Voris, R. 210

PERSONALS

Harris, T. W. 65

REVIEWS

Comstock: An Introduction to entomology 269
Emaus: About spiders, introducing Arachne 299
Fox: Fleas of eastern United States 119
Gertsch: The Spider book... 178
Harvey: Living light..... 208
Matheson: A Laboratory guide in entomology..... 150
Metcalf & Flint: Destructive and useful insects; their habits and control..... 177
Needham: Introducing insects 299
Osborn and Knull: Meadow and pasture Insects..... 28
Revista de Entomologia..... 19
Sandhouse: The North American bees of the genus Osmia 28
Setty & Cooper: Studies in the Mecoptera 179
Shepard, H. H. The Chemistry and toxicology of insecticides 179
Staig: The Fabrician types of insects in the Hunterian Collection at Glasgow University. Coleoptera, Part II 235

Thomas: The biology and control of wireworms..... 300
Traver: Compendium of Entomological methods 178
Wild: The Butterflies of the Niagara Frontier Region... 269
Zeuner: Fossil Orthoptera Ensifera 59

GEOGRAPHICAL DISTRIBUTION

Arizona: Arach. 107, 125; Col. 286; Hom. 290.
California: Col. 190, 251, 285; Hym. 168; Orth. 222.
Central America: Dipt. 248
Colorado: Hem. 172; Odon. 31, 103.
Florida: Arach. 17, 48, 165; Col. 198; Neur. 271.
Georgia: Dipt. 102
Illinois: Dipt. 100; Orth. 123; Thysan. 95.
Indiana: Hym. 11
Kansas: Hem. 35
Louisiana: Odon. 194
Maine: Dipt. 83; Orth. 227.
Maine: List of the dragonflies, 45, 74.
Maryland Odonata, List of, 37, 67.
Massachusetts: Odon 61
Michigan Diptera, List of.... 243
Missouri: Orth. 4
Nebraska: Hem. 35
New Jersey: Orth. 43
New Mexico: Arach.....107, 125
North Carolina: Arach. 282; Dipt., 99, 243.
Ohio: Hym. 241
Pennsylvania: Col. 72; Neur. 12.
South America: Dipt. 168, 249; Hym. 79.
South Carolina: Col. 169
Texas: Arach. 107, 125, 156; Hom. 291.
Utah: Hom. 196
Utah Dolichopodidae 129
Virginia: Hem. 35

COLEOPTERA

acostata, Methia* 287
Allaeocnemis (see *Polycaon*)
Amphicerus 193
angustus, Bostrichus 192
Anoplodera 256
Apate 192
aquatica, Helodes* 190
Arhopalus 254
aspera, Dendrobiella 192
aspericollis, Amphicerus 193
barbata, Polyphylla 138
Batrisodes 169
bicaudatus, Amphicerus 193
bicornis, Bostrichus 193
Bostrichidae 192
Bostrichus 192
brevicollis, Derobrachus 253
brevis, Dinoderus 193
brevis, Methia 286
californicus, Lichenophanus .. 193
*Callidiellum** 254
Callidium 253
capucinus, Bostrichus 193
carinata, Methia* 289
cartwrighti, Batrisodes 169
cavifrons, Polyphylla 138
Cerambyx 254
cleroides, Psoa 193
cornutus, Amphicerus 193
cribrulosa, Diplotaxis 252
Criocephalum (see *Arhopalus*)
Criocephalus (see *Arhopalus*)
cupressi, Semanotus 254
curvatus, Batrisodes* 170
cylindricus, Prionus 253
dahli, Diplotaxis* 251
Dascillidae 190
Dendrobiella 192

Derobrachus 253
Dinoderus 193
Diplotaxis 251
dubia, Methia 286
Dytiscidae 198
Eburia 257
Elaphidion 258
elephas, Megasoma 72
exesum, Heterarthron 193
Exops (see *Polycaon*)
falli, Eburia* 257
falli, Methia 290
femorale, Heterarthron 193
floridanum, Sinoxylon 192
floridanus, Hydroporus* 198
gonagrum, Heterarthron 193
hardyi, Callidium 253
Helodes 190
Heterarthron 193
hirtellum, Callidium 253
Hydroporus 198
imbelle, Elaphidion 258
isabellae, Leptura 257
jacintana, Anoplodera* 256
knulli, Methia* 288
Leptura 257
Lichenophanes 192
Lichenophanus 193
longicornis, Tetrapriocera 192
lucanus, Lichenophanes 193
*Meganoplium** 258
Megasoma 72
Methia 285
mutchleri, Lichenophanes 192
Orthosoma 253
pacifica, Strangalia 255
Phyllophaga, Flight records of 279
Phymatodes 253
Polycaon 193
Polyphylla 138
In America, north of Mexico 134
Prionus 253
(see *Orthosoma*)
Pselaphidae 169
Psoa 193
pubescens, Dendrobiella 192
pubescens, Polycaon 193
punctatus, Polycaon 193
pusilla, Methia 290
robusta, Methia* 285
rufipenne, Callidium 254
rusticus, Cerambyx 254
scapularis, Anoplodera 257
Scarabaeidae 72, 134, 251, 279.
Semanotus 254
semipubescens, Eburia 257
serricollis, Bostrichus 193
sexguttata, Psoa 193
Sinoxylon 192
Strangalia 255
Tetrapriocera 192
torquata, Xylomeira 192
Tragosoma 253
tridens, Apate 192
vile, Callidium 253
vilitatis, Phymatodes* 253
Xylomeira 192

DIPTERA

Anopheles 168
atrata, Rhegmoclema 274
broweri, Tipula* 83
carbonarius, Ceroplatus 244
carolina, Phthinia* 246
castus, Polymedon 132
Ceroplatus 243
Cerotelion (see *Ceroplatus*)
Chionea 100
croesus, Mesogramma* 248
Culicidae 168
Dolichopus 129
Erioptera 102
fultoni, Platyura* 245
gambiae, Anopheles 168
gigantea, Pedicia* 99
hendersoni, Parasyntormon ... 133
hondurania, Microdon* 247
johannseni, Ceroplatus* 243
lineatus, Ceroplatus 243
Mesogramma 248

Microdon 247
Mycetophilidae 243
Parasyntormon 133
Pedicia 99
Phthinia 246
Platyura 245
*polygraphica**, *Mesogramma*.. 249
Polymedon 132
Rhegmoclema 274
Rutylapa (see *Platyura*)
Salpingogaster 250
*stigmatipennis**, *Salpingogaster* 250
*stoneana**, *Chionea* 100
*sweetmani**, *Erioptera* 102
Syntormon 130
Tipula 83
Tipulidae 83, 99
*uintaensis**, *Syntormon* 130
*vernaae**, *Dolichopus* 129

EPHEMERIDA

Stenonema vicarium, mating.... flights 12
vicarium, *Stenonema* 12

HEMIPTERA

aetheocornum, *Macrosiphum*.. 197
Alebra 291
Andrallus 60
Apateticus 60
Aphididae 196
Aphis 196
Amphorophora 196
*balli**, *Carneocephala* 290
Capitophorus 196
Carneocephala 290
cefsmithi, *Capitophorus* 196
Cicadellidae 290
Corythucha 172
crenicornum, *Macrosiphum*... 196
*fasciventris**, *Pagasa* 35
geranii, *Amphorophora* 196
*interrogata**, *Alebra* 291
ludovicianus, *Apateticus* 60
Macrosiphum 196
Nabidae 35
Pagasa 35
Pentatomidae 60
Reduviidae in Oklahoma..... 139
rumicis, *Aphis* 196
solanifolii, *Macrosiphum* 196
spinidens, *Andrallus* 60
Tingitidae 172
*tuthilli**, *Corythucha* 172

HYMENOPTERA

Aphaenogaster 241
appendigaster, *Evania* 18
aquia, *Aphaenogaster* 241
armata, *Pyria* 50
bihamata, *Pseudodichrysis*.... 50
chalybii, *Melittobia* 227
Chrysididae, Genotypes of the, Corrections and additions to 50
Chrysis (see *Pseudodichrysis*)
*colombianus**, *Polistes* 80
Dichrysis (see *Pseudodichrysis*)
Dryinidae 10
Encopognathus 167
Eurychrysis 50
Evania 18
Evanidae 18
Formicidae 241
hagenowi, *Tetrastichus* 273
Hedychrydium (see *Hexachrydium*)
Hexachrydium 50
Lethus, Generic name 216
lincea, *Pyria* 50
*magnus**, *Pseudogonatopus*... 11
Melittobia 227
Polistes 79
Pseudodichrysis 50
Pseudogonatopus 11
Pyria 50
*rufiventris**, *Encopognathus*... 167
*satanulus**, *Polistes* 82
sexdentatum, *Hexachrydium*.. 50

stilbiceps, Eurychrysis 50
Tetrastichus 273
Vespidae 79
weyrauchi, Polistes* 79
willei, Polistes* 81
xanthogaster, Polistes* 81
Zethus 217

LEPIDOPTERA

Callosamia promethea, digestive system of.....181, 211
carolina, Protoparce 212
cecropia, Samia 213
Dolba 166
Epargyreus 212
Haemorrhagia 212
hylaeus, Dolba 166
Madoryx 165
promethea, Callosamia ...181, 211
Protoparce 212
pseudothyreus, Madoryx..... 165
Samia 213
Saturniidae 181, 211
thysbe, Haemorrhagia 212
tityrus, Epargyreus 212

ODONATA

Aeschna 31
Agrionidae 103
Altitudinal Range of dragonflies in Pikes Peak Region 31
confraternus, Gomphus 15
*Eolestes** 104
flavocaudatus, Gomphus* 194
Gomphidae 194
Gomphus 15
juncea, Aeschna 31
Collecting in Massachusetts... 61
synthetica, Eolestes* 105

ORTHOPTERA

Acrididae 1, 43
americana, Periplaneta 121, 151, 186, 223, 273.
americana, Schistocerca 43
Aristiger 139
Bion 60
*Bionoblatta** (see *Bion*)
Blatta 121, 275
Blatella germanica, Effect of isolation on growth..... 293
Blattidae 4, 33, 121, 151, 186, 222, 273, 293.
Checklist of North American Orthoptera, Notice of..... 90
coerulescens, Oedipoda 1
cubensis, Phyllodromia 222
Dicellura 218
Dicellurina (see *Dicellura*)
differentialis, Melanoplus 1
domesticus, Gryllus 227
Eurylestes 139
Generic names, Replacement in Blattidae 139
germanica, Blattella 293
Gryllidae 227
Gryllus 227
Habra 218
Lethus, Generic name 216
mastrucatus, Bion 60
Mayamastax 216
Melanoplus 1
Oedipoda 1
Parasites of Periplaneta 273
orientalis, Blatta 121, 275
Parcoblatta pennsylvanica, Life history 4, 33, 121, 275.
pennsylvanica, Parcoblatta 4, 33, 121, 275.
Periplaneta americana, Life History 121, 151, 186, 223, 273.
Phyllodromia 222
Platylestes (see *Eurylestes*)
Plumiger (see *Aristiger*).... 139
Schistocerca 43
Sigmella (see *Sigmoidella*)
Sigmoidella 236
Supella 222
supellectilium, Supella 222
Spermatheca of grasshoppers, Variations in 1

THYSANURA

Ctenolepisma 95
domestica, Thermobia 97
Lepisma 98
Lepismatidae 95, 271
longicaudata, Ctenolepisma... 98
Nicoletia 271
quadriseriata, Ctenolepisma... 98
saccharina, Lepisma 98
tergata, Nicoletia* 271
Thermobia 97
urbana, Ctenolepisma* 95

NON-HEXAPODA

Apheloria 284
Argiopidae 17
bifurca, Cyclosa 17
Brachydesmus 284
brachygon, Sigmoria* 283
Centipedes from Texas, New Mexico, Arizona ..107, 125, 156
Cryptops 107
Cyclosa 17
diffusus, Lamyctes* 126
dux, Brachydesmus* 284
eques, Cryptops* 107
Eulithobius 48
furcifer, Mimloria* 282
goffi, Pholobius* 49
hypogeus, Eulithobius* 48
kerrana, Linotaenia* 110
Lamyctes 126
Linotaenia 110
*Liobius** 127
*Llanobius** 128
Mimloria 282
mimus, Liobius* 127
mundior, Pholobius* 157
paucispinus, Llanobius* 128
Pholobius 49, 157
Rhizoglyphus 274
santus, Llanobius* 156
Sigmoria 283
Simoporus 109
tarsalus, Rhizoglyphus 274
texanus, Simoporus* 109
*Texobius** 156
unicus, Texobius* 157
waccamana, Apheloria* 284

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being ongest in) are discontinued.

Wanted.—Nitidulidae for determination or exchange. Correspondence desired with those who will collect. H. R. Dodge, 78 Anne Street, Clintonville, Wisconsin.

Wanted.—To hear from specialists who would care to determine some family of insects for a share of the duplicates. We have many specimens, especially in some families of Diptera and Hymenoptera. H. E. Jaques, Iowa Insect Survey, Mt. Pleasant, Iowa.

Insects from Northern Korea.—I will collect insects for specialists in certain groups upon their request; very rich fauna; rates reasonable. Address: Mr. Alexander M. Yankovsky, Shuotsu-Ompo, Korea, Japan.

Wanted—Living specimens of the luminous beetle **Phengodes** this summer. E. Newton Harvey, The Biology Dept., Princeton University, Princeton, New Jersey.

Malacodermata (except Lycidae and Cleridae) of the world. Will determine and purchase. Also exchange against Col. or all other insects from Bolivia. Walter Wittmer, Casilla 219, Oruro, Bolivia, S. America.

I want to collect Rothschildia, agapema, gulfina and io moths and Texas butterflies for interested persons. Eula Frizzell, R 4 San Benito, Texas.

Wanted—To hear from collectors who desire extra good cocoons of Michigan **Platysamia columbia,** that will emerge June, 1941. W. S. McAlpine, 575 Townsend St., Birmngham, Michigan.

Wanted—Specimens of the genus Trox from North America. Will exchange or determine for duplicate material. Mark Robinson, 231 Cherry St., Sharon Hill, Pennsylvania.

Lepidoptera—From the South, including P. palamedes, T. halesus and E. jucunda to exchange for fauna from other localities. H. W. Eustis, 2230 McDowell St., Augusta, Georgia.

Wanted—Egg cases of preying mantids. Correspondence desired with those who will collect. Osmond P. Breland, Department of Zoology, The University of Texas, Austin, Texas.

✚ AMERICAN RED CROSS ✚

Preparedness for national defense has two aspects: preparedness of the country both as to materials and manpower; preparedness of the individual to assume the tasks that may devolve upon him. More than any others, college men and women should prepare themselves for the tasks that lie ahead. They are the future leaders of our people. To them will fall, and perhaps sooner than they think, a great number of opportunities of proving themselves.

For many years the Red Cross has been qualifying college students as instructors in swimming and the skills of life saving and in first aid. A recent announcement by the Bureau of Medicine and Surgery, U. S. Navy, calls attention to the fact that individuals holding Red Cross certificates of various grades may qualify in the Naval Reserve as hospital apprentices, pharmacist's mates, to as high as chief pharmacist's mate.

Every effort is being bent to increase the Red Cross Nurses' reserve so that, in case of need, naval and military hospitals will not be understaffed. At the same time there must be a great increase in the number of young women trained in home care of the sick and methods of preventing illness and its spread. Still another field exists. For the past year a growing army of volunteers, now numbering more than half a million, has been at work producing garments and surgical dressings for use in European war zones. In case of national emergency affecting this country, this volunteer effort must be greatly expanded.

There are 3,721 Red Cross chapters. Each of these sponsors volunteer services and each offers free instructions in first aid, swimmingand life saving, and home care of the sick. From November 11 to November 30 these chapters will conduct their annual Roll Call of members for the coming year. Chapters located in college and university towns will make every effort to interest students, not only in affiliating with the organization, but in those Red Cross activities that will help strengthen our country to meet any possible emergency.

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